Changing fashion trends and rapidly advancing technology has led to the shortening of life-spans for many of today’s products. Mobile phones, cars and personal computers are just some of the products which are constantly re-engineered, re-styled and re-marketed to meet our growing demands for better products. These demands, however, are placing a heavy burden on our natural and physical resources, particularly during manufacture and when the products reach their end-of-life. It is becoming clear that we cannot sustain such a fast rate of product-life turnover without considering both the environmental and economic impacts this has on the planet.

Having spent the last three years in Beijing, China, I was exposed daily to the growing mounds of waste that is a direct byproduct of a ruthless consumer economy and it made me intensely aware of how unsustainable our rate of consumption is. Environmentalists talk a lot about “closing the material loop” and “life cycle assessment” as tools for making the very best use of our natural resources.

China currently has a very extreme economic climate. The economy is shifting at a tremendous speed and millions of people are moving into urban environments and starting to consume like the West. The extreme income gaps that exist in the urban environments are becoming greater, and there is little to no government support systems for those that are marginalised. In contrast to countries such as Sweden, the Chinese government only supply a very basic infrastructure for the waste. This, along with large income gaps, consequently produces a whole range of informal markets where people are making their living off the waste stream. Street corners and shopfronts are constantly transformed into vibrant hubs of these informal waste markets where materials such as plastics, cardboard, aluminium are sorted and resold. The constant visualisation of waste streams along the streets of Beijing was an inspiration and a starting point for my research and this project.
THE WASTE HIERARCHY

A TOOL FOR DISCUSSING WASTE MANAGEMENT

Through research I quickly stumbled across the concept of the Waste Hierarchy. The concept is widely used in the sustainable waste management discussion and works as a tool for policy making. The waste hierarchy aims to encourage the management of waste materials in order to reduce the amount of waste materials produced, and to recover maximum value from the waste that is generated. It is not applied as a strict hierarchy as many complex factors influence the optimal management for any given waste material. However, as a guide, it encourages the prevention of waste, followed by the reuse and refurbishment of goods, then value recovery through recycling and composting. In essence, policy making in countries like Sweden actively try to work to constantly move up the hierarchy when passing new policy on waste.

UPCYCLING: Upcycling, the practice of converting waste materials into products of greater value, is a philosophy that transforms the way we conceive of waste. Upcycling is not just a solution to a problem, but a new method of thinking about and working with waste. Sweden, for example, is a great leader in this area and has developed systems and policies to promote upcycling.

15-20 YEARS BACK, MAJORITY OF WASTE WAS SIMPLY THROWN INTO THE GROUND. GARBAGE IS BURNED TO GENERATE ELECTRICITY. SWEDEN EVEN IMPORTS GARBAGE TO BE INCINERATED. DOWNCYCLING!

A TAX ON PACKAGING WAS INTRODUCED. THE TAX MONEY GOES TO PAY FOR COST OF RECYCLING. THROUGH PROVIDING COMPAREABLY CHEAP SPACE, CREATING A TREND AND AWARENESS. INFILTRATING EDUCATION AND PRODUCING COMPANIES TO SPREAD THE WORD ABOUT THE STATE OF THE WORLD.
Unlike China, Sweden has a well-organized and centralized system for the handling of waste. For this system to be fully functional, it requires each individual to sort their waste as much as possible and make use of the small recycling stations in the neighborhood. Information around how to sort your waste is poor and the engagement of people in general is pretty low. Today Stockholm has five big recycling stations and are all placed in the periphery of the city so you need a car to reach them. There are also mobile recycling stations in the city center and in some of the smaller suburbs. These recycling centers primarily serve the villa suburbs. Those living in apartment buildings in the city either have a bulky waste room or organized trash pick-up yearly. A consequence of rental apartments being sold out is that bulky waste rooms are being converted into other spaces and that puts pressure on the need to redefine the recycling center typology for the future.

After finding a published referral from the Traffic Office in the Municipality of Stockholm online highlighting the current situation at Östberga Recycling Center, I got in contact with some key people from the municipality to discuss the issue further.
In the Municipality of Göteborg they saw the need to better follow the waste hierarchy goals dictated by the national environmental policy. They made an investment in one of the existing recycling centers, Alelycka, and added facilities for re-using the bulky waste, construction waste, and clothing people brought in.

The new Eco-cycle Park was marketed as a destination in contrast to typical recycling centers. At Alelycka you have the possibility to make a daytrip out of getting rid of your bulky waste. The center also collaborates with the local schools, hosting guided tours for kids to educate them in matters of waste. This project has also produced many job opportunities for the community.

A national report evaluating the effects of investing in Alelycka Eco-cycle parks was released in March 2011. The report gave a hard digital crunch of the apparent waste reductions after the implementation of Alelycka. Considering that Alelycka was conceived less than five years ago, the long-term effect are yet to be seen, but the improvements are positive overall.
Construction Waste Management is the practice of reducing the actual waste that goes to the dump site. Waste reduction is best met by recycling and construction wastes do offer a lot of opportunities for recycling. In fact, 80% of the wastes found in construction trash heaps are recyclable, one way or another (brick, asphalt, concrete, debris, metal, glass and even paint) or for other useful purposes or re-use.

DfD is a new concept for the design and building community that intends to maximize materials conservation and extend and even create buildings and building materials for extended use. DfD is intended to enable a focus on reducing waste and extend it by extending the life of structures and services that are typically removed. DfD is intended to maximize materials conservation from building end-of-life management, and create adaptable buildings to avoid building removals altogether. Given that many buildings are removed from sites due to redevelopment and their inability to remain useful within an alternative land use, DfD can also be an intelligent strategy to prevent obsolescence and mitigate economic factors (such as labor costs) that encourage destructive demolition and disposal of buildings.

DfD is intended to create buildings that are stocks of future building materials. This enabling of materials conservation and buildings that facilitate the recovery of all components of the building to be adapted to provide both sustainable and environmental benefits for builders, owners and occupants, and this construction needs to have building teams that are prepared to undertake the appropriate job.

Recycling is an important tenant of sustainability, but in order to be effective, products need to be easily disassembled into component parts and separated by material. If this is difficult, they do not end up in the landfill after being disposed of. The worst parts, in terms of recycling, are those made from two different materials bonded together, because they are not easily removed. The Cradle to Cradle framework designates this as “monstrous hybrids.” A good example of this type of hybrid would be a milk and juice carton that comes with circular pour spouts and caps built into the side. The plastic cap and spout can’t be recycled with the waxed cardboard, and yet there are no easy ways for recyclers to separate these quickly. Similar products associated with complex assemblies are requiring orders of multiple parts to be identified and sorted into categories of waste.

In order to start producing a new market for re-used construction material, the building needs to be designed with this in mind on the outset. There are four ways for BCA explained in following diagrams.

1. THE WASTE HIERARCHY
   A hierarchy of waste management strategies, including those that are desirable. The focus is on reducing waste and recycling.
   REDUCE
   REUSE
   RECYCLE

2. TIME LAYERS
   The six S’s from Stuart Brand’s book “How buildings learn.” Brand argues that different layers of a building have different lifespans, it is therefore important to design with clear differentiation of the layers.

3. COMPONENTS AND CONNECTIONS
   Firstly minimize the different types of materials. Then design visible joints and connectors using bolted, screwed and nailed connections that will withstand repeated assembly and disassembly to allow for adaptation and for the connectors to be reused.

4. DESIGN FOR DISSEMBLY
   A STRATEGY FOR REDUCING CONSTRUCTION WASTE
   Site Structure Skin Services Space Plan Stuff
   Reduce Reuse Recycle